

KANSAS FARM OPERATORS - 1955 AND 1965
A LONGITUDINAL STUDY

by

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INTRODUCTION

The economy of Kansas and of its farm families has been affected by many changes in its agriculture. Measures of some of those changes can be obtained by comparing census data periodically. The basic sources are: (1) the Census of Kansas Population and the Census of Kansas Agriculture, compiled annually by county assessors and filed with the Kansas State Board of Agriculture; (2) the five-year United States Census of Agriculture; and (3) the decennial United States Census of Population. Anderson (1967, pp. 1-5) reviewed recent data for changes in: (1) United States and Kansas rural-farm population, (2) number of farms in the United States and Kansas, (3) size of farm, (4) mobility, and (5) age. Her findings, together with supplementary facts relevant to the present study, are summarized:

The number of farms in Kansas has declined during the period of this study. In 1950 there were 131,372 farms. By 1954 the number had decreased to 120,167, and in 1959, there were 104,347 farms (U. S. Census of Agriculture, 1959). The decline continued to 92,440 farms in 1964 (U. S. Census of Agriculture, 1964). Thus, the total decline represents a 30 percent decrease in the number of farms in Kansas between 1950 and 1964.

The average farm size in Kansas increased 47 percent during the 1950-1964 period. At the beginning of this fifteen year time span the average farm size was 370 acres

(U. S. Census of Agriculture, 1950). By 1954 the farm size had increased to 416 acres, and to 481 acres in 1959 (U. S. Census of Agriculture, 1959). By 1964 the average farm size was 544 acres (U. S. Census of Agriculture, 1964).

The mean age of the Kansas farm operator increased 6 percent between 1950 and 1964: from 48.4 years to 51.3 years (U. S. Census of Agriculture, 1950, 1964). The mean age for the intermediate years of 1954 and 1959 was 48.6 and 50.5 years, respectively (U. S. Census of Agriculture, 1955, 1959). The increases of the mean ages are small, but they reflect changes in the structure of the age distribution. Although the total number of farm operators in Kansas declined 30 percent during the fifteen year period 1950-1964, the number of those under 35 years decreased 54 percent (Table 1). The number of operators in the older age groups also decreased, but at a lower rate. The least decrease was 12 percent for those 65 years or older (U. S. Census of Agriculture, 1950, 1954, 1959, 1964).

There were also changes in the structure of age distribution. In 1950 farm operators under 35 years represented 20 percent of all farm operators, and those 65 years or older, 15 percent. By 1964 the total number of those under 35 years had declined to 12 percent, and the total number of farm operators 65 years or over had increased to 18 percent (Table 1). The change in the number of farm operators since 1920, according to Clawson (1963), has been due primarily to

TABLE 1. Distribution of Kansas farm operators by age for years 1950, 1954, 1959 and 1964

Age of Operator	1950		1954		1959		1964		Percentage Change 1950-1964
	No.	%	No.	%	No.	%	No.	%	
under 35	24,424	20	19,518	16	14,127	14	11,149	12	- 54
35 - 44	28,176	22	26,901	23	21,923	21	18,965	20	- 33
45 - 54	28,316	23	28,037	24	26,181	26	23,928	26	- 15
55 - 64	25,632	20	24,741	21	22,467	22	21,970	24	- 14
65 +	18,569	15	19,381	16	17,873	17	16,428	18	- 12
Total Reporting	125,117	100	118,578	100	102,571	100	92,440	100	
Not Reporting	6,255		1,713		1,563				
Total Operators	131,372		120,167		104,347		92,440		
Mean Age	48.4		48.6		50.5		51.3		

Sources: U. S. Census of Agriculture, 1950.

Ibid., 1954.Ibid., 1959.Ibid., 1964.

the reduction of younger men entering farming. Withdrawal of those already in farming is a minor contributing factor to the decline of farm operator numbers. The result has been an older farm operator population.

Farm residents are the least mobile of all occupational groups (Pederson, 1963 and Lansing, 1963). However, the migration of farm operators into non-farm occupations has increased continually and is represented by the steady decline of the percentage of population living on farms since the first census of 1790 (Guither, 1965).

The rural-farm population of Kansas declined from 435,504 or 23 percent of the total population in 1950 to 291,097 or 15 percent in 1960 (Table 2), which represents a 33 percent decrease in the rural-farm population (U. S. Census of Population, 1950, 1960). During this ten year period the population of Kansas increased 4 percent; from 1,866,517 in 1950 to 1,932,501 in 1960.

The mobility of the Kansas population has increased between 1950 and 1960. The percentage of population that changed residence increased from 19 percent in 1950 to 48 percent in 1960. The Kansas rural-farm population also increased in mobility. In 1950, 10 percent of the rural-farm population moved, and in 1960, 21 percent changed their place of residence. Over half of the mobility of the rural-farm population was within the same county. The remainder moved from another county either within Kansas or from other states (Table 2).

TABLE 2. Distribution of Kansas and rural-farm population mobility for 1950 and 1960

	1950		1960	
	Kansas No.	%	Rural-Farm No.	%
Population	<u>1,866,517</u>	<u>100</u>	<u>435,504</u>	<u>100</u>
Non-movers	1,474,737	81	388,704	90
Movers	<u>352,675</u>	<u>19</u>	<u>41,800</u>	<u>10</u>
Same County	205,320	11	24,440	6
Different County	<u>147,355</u>	<u>8</u>	<u>17,360</u>	<u>4</u>
Within State	68,870	4	10,600	2
From Other States	78,485	4	6,760	2
			222,659	11
			7,119	3

Sources: U. S. Census of Population, 1950.

Ibid., 1960.

Changes in population may also be studied by taking observations at some point in time and then observing them at another point in time. This "longitudinal method" requires identifying the individuals at both time periods, but such data are seldom available. However, longitudinal data on Kansas farm operators are available for the years 1955 and 1965. Those data were collected as a part of Organized Research Project Number 427 of the Kansas Agricultural Experiment Station.

The 1955 study was based on a stratified random sample of farm families selected from the ten economic areas of the state, as defined by the 1954 United States Census of Agriculture (Morse, 1965, pp. 83-85). Personally interviewed were 527 Kansas farm-operator families. This study provided a statistical profile of their economic status and provisions for financial security at that point in time (Morse, 1965).

A follow-up mail survey of the families interviewed in 1955 was conducted in 1965 (Anderson, 1967). The 1965 questionnaire employed a reduced schedule of questions that could be answered by mail. This permitted direct comparison of 1965 with 1955 data. Such a longitudinal study provided an opportunity to identify shifts for each farm operator in farm mobility, continuation in farming and change in farm size, farming operations and other farm-family related factors.

The 1965 mail survey produced information from 94 percent of the 527 families interviewed in 1955 with 80 percent

being usable. The 1955 and 1965 data were coded and transferred to IBM cards. Those cards and the Anderson code book to identify the responses are on file in the Department of Family Economics.

The Kolmogorov-Smirnov test of Goodness of Fit was used to determine the deviation from the original random sample and the reliability inherent in the incomplete returns. The 1955 families who responded in 1965 were not significantly different in regard to size of farm, size of family, income and net worth from those who did not respond. However, they were significantly different with regard to age, life insurance coverage and the Morse-Johnston Scale of Family Life Cycle. Further analysis of the data was recommended by Anderson (1967) to contrast the families in 1965 with their status in 1955 according to the characteristics of age of husband, age of wife, Morse-Johnston Scale, size of farm, size of family, income, net worth and life insurance. However, she stated that since the 80 percent who responded in 1965 were not a representative sample of the 527 who participated in 1955, the bias of respondents to be younger should be taken into consideration. After preliminary analysis and consideration of Anderson's results, the following characteristics were eliminated from the present study: age of wife, life insurance, Morse-Johnston Scale and size of family. Age of farm operator, the only remaining characteristic significantly different between respondents and nonrespondents from

Anderson's study, was recognized in the analysis of the data.

OBJECTIVES

The over-all purpose of this study was to compare the 1955 and 1965 data on Kansas farm operators for significant changes. Specifically, the objectives were:

1. To determine the distinctive differences in selected 1955 farm operator and operation characteristics (age, net worth, total net income, acres owned, acres rented from others, acres rented to others and acres farmed) between operators classified by:
 - a. their continuing and not continuing to farm from 1955 to 1965;
 - b. their age in 1955 as younger (under 55) and older; and
 - c. combinations of the age and continuation in farming classes.
2. To study changes in number of acres owned, acres rented from others, acres rented to others and acres farmed between 1955 and 1965 for farm operators classified by age and continuation in farming.

PROCEDURES

Anderson (1967) classified as usable 420 of the replies to the 1965 questionnaires mailed to the 527 farm operator families interviewed in 1955. However, as these replies

were subjected to analysis in this study, seven were considered unusable. This study, therefore, is based on reports from 413 farm operators for the years 1955 and 1965.

Seven classes of mobility between 1955 and 1965 were recognized:

1. same farm, same county, same state
2. different farm, same county, same state
3. different farm, different county, same state
4. different farm, different county, different state
5. off farm, same county, same state
6. off farm, different county, same state
7. off farm, different county, different state

A frequency count was made by the Kansas State University Statistical Laboratory of the families for each of those classes with respect to:

1. characteristics of families and farms in 1955
 - a. age of farm operator
 - b. number of years married
 - c. size of family
 - d. period in life cycle
 - e. size of farm operated
 - f. total net income from farming and other sources
 - g. net worth (including cash value of paid up life insurance
 - h. face value of life insurance policies
 - i. Morse-Johnston Scale

- j. Sewell Score
 - k. age of wife
 - l. net worth (quintiles)
 - m. living location after retirement
 - n. living arrangements after retirement
 - o. expected amount needed after retirement
 - p. will - have or do not have
 - q. authorities making will
 - r. farm situation.
2. characteristics of families and farms in 1965
- a. change in size of farm operation - acres owned
 - b. change in size of farm operation - acres rented from others
 - c. change in size of farm operation - acres rented to others
 - d. change in size of farm operation - acres farmed
 - e. size of family at home
 - f. retirement plans
 - g. reduction of farm operations
 - h. retirement from all farming
 - i. living location after retirement
 - j. living arrangements after retirement
 - k. expected amount needed after retirement
 - l. will - have or do not have
 - m. authorities making will
 - n. farm situation

Operators also were classified as to whether they were still farming in 1965 or had discontinued farming. Tables were constructed and percentages calculated. The data were evaluated for internal consistency and relevance to the objectives. As a result, the following characteristics were eliminated:

1. number of years married
2. period in the life cycle
3. Morse-Johnston Scale
4. age of wife
5. Sewell Score
6. net worth (including paid up value of life insurance)
7. life insurance coverage
8. size of family at home

The reasons for elimination were: The age of husband adequately reflected the age of wife and the number of years married. The several family life cycle scales and family size provided more detail than could be utilized in this study. The Sewell Score had proved ineffective even in the 1955 study. Net worth, including paid up value of life insurance, and life insurance coverage did not provide sufficient additional information to warrant their use over the quintile distribution of net worth.

The following items from the 1955 interview schedules and the 1965 questionnaires were added to facilitate an

analysis of changes in farm operation:

1. actual age of farm operators in 1955
2. actual number of acres owned in 1955 and 1965
3. actual number of acres rented from others in 1955 and 1965
4. actual number of acres rented to others in 1955 and 1965
5. actual number of acres farmed in 1955 and 1965

Analysis of Data

Two-way frequency tables were constructed and chi square values were computed by the Kansas State University Computing Center to test for significance in relationships between pairs of characteristics. The four characteristics used as controls were:

1. age of farm operator in 1955
2. net worth in 1955
3. total net income from farming and other sources in 1955
4. continuation in farming between 1955 and 1965

One result of this voluminous compilation was realization of the desirability of reducing the number of classes of characteristics. Also, an important relationship was noted between continuation of farm operation and age of farm operator: The proportion continuing in farming decreased as age increased. The age class in which the proportion continuing

in farming approximated 50 percent was 55 to 59 years. Farm operators who were under 55 years of age in 1955 were classified as younger; those 55 and over were classified as older.

This permitted a four-fold classification of farm operators:

1. younger and continuing farm operators
2. younger and noncontinuing farm operators
3. older and continuing farm operators
4. older and noncontinuing farm operators

Frequency tables were constructed and chi square values computed by the Kansas State University Computing Center for each coded characteristic previously listed on pages 9 and 10, for each of the four classifications of farm operators. The result of those compilations was an evaluation of the data for relevance to the objectives. The following characteristics were eliminated from further consideration in this study as they related to the special group of only 49 operators who were 65 years old in 1955:

1. retirement plans
2. reduction of farm operations
3. retirement from all farming
4. living location after retirement
5. living arrangements after retirement
6. expected amount needed after retirement
7. will - have or do not have
8. authorities making will
9. farm situation

The remaining characteristics subjected to analysis were:

1. age of farm operator in 1955
2. continuation in farming between 1955 and 1965
3. net worth (quintiles) in 1955
4. total net income from farming and other sources in 1955
5. acres owned in 1955 and 1965
6. acres rented from others in 1955 and 1965
7. acres rented to others in 1955 and 1965
8. acres farmed in 1955 and 1965
9. difference in acres owned between 1955 and 1965
10. difference in acres rented from others between 1955 and 1965
11. difference in acres rented to others between 1955 and 1965
12. difference in acres farmed between 1955 and 1965

For the data on actual farm size that were not coded, one-way analysis of variance values were computed by the Kansas State University Statistical Laboratory for each of the four classes of farm operators. The Kolmogrov-Smirnov test was applied to the remaining characteristics for each of the four classes of farm operators (Siegel, 1956).

RESULTS AND DISCUSSION

First presented is an analysis of the differences between operators continuing and not continuing to farm in 1965

according to their 1955 farm operation characteristics: net worth, total net income, acres owned, acres rented from others, acres rented to others and acres farmed. Differences in those characteristics are then noted for the younger and older operators. The two approaches are combined for partial analyses of differences by age and continuation in farming.

For those operators continuing to farm in 1965, changes in size of farm operation since 1955 are presented. And, for those who discontinued farming after 1955, changes in land ownership and rental are presented.

Continuity in Farming

The farm operators were classified as to whether they were still farming in 1965 or had discontinued farming after 1955. Of the 413 operators from whom information was obtained in 1955 and 1965, 73 percent, or 301, had continued to farm, and 27 percent, or 112, had discontinued farming.

Age

Farm operators continuing to farm in 1965 were significantly younger (44.7 years) than those not continuing to farm (56.7 years). The major difference between the cumulative relative frequency of the continuing and noncontinuing farm operators was at the 50 to 54 age class (Table 3).

TABLE 3. Cumulative relative frequency of the continuing and noncontinuing farm operators in 1965 by age in 1955

Age in 1955	Continuing Farm Operators			Noncontinuing Farm Operators			Differences in Percents
	Number	Percent	Cumulative Percent	Number	Percent	Cumulative Percent	
20 - 29	18	5.98	5.98	3	2.68	2.68	3.30
30 - 34	40	13.29	19.27	3	2.68	5.36	13.91
35 - 39	42	13.95	33.22	3	2.68	8.04	25.18
40 - 44	49	16.28	49.50	10	8.93	16.97	32.53
45 - 49	59	19.60	69.10	11	9.82	26.79	42.31
50 - 54	38	12.62	81.72	10	8.93	35.72	46.00***
55 - 59	22	7.31	89.03	17	15.18	50.90	38.13
60 - 64	15	4.98	94.01	24	21.43	72.33	21.68
65 - 69	13	4.32	98.33	18	16.07	88.40	9.93
70 - 74	4	1.33	99.66	10	8.93	97.33	2.33
75 +	1	0.33	99.99	3	2.68	100.01	
Total	301			112			
Mean Age	44.7			56.7			

***Significant at the 0.1% level.

Net Worth

The net worth quintiles, shown in Table 4, were determined in 1955 by ranking the 527 families interviewed in order of net worth. They were then divided into five classes of approximately equal numbers (Morse, 1965, pp. 6-7).

The median net worth occurred in the third quintile, \$20,001 - \$35,000 (Table 4). Although higher for the continuing operators (\$30,051) than for the noncontinuing operators (\$26,967), there was no significant difference in the distributions of operators by net worth.

TABLE 4. Cumulative relative frequency of continuing and noncontinuing farm operators in 1965 by net worth in 1955

Net Worth in 1955	Continuing Farm Operators			Noncontinuing Farm Operators			Differences in Percents
	Number	Percent	Cumulative Percent	Number	Percent	Cumulative Percent	
Deficit to + \$10,000	55	18.27	18.27	22	19.64	19.64	- 1.37
\$ 10,001 - \$ 20,000	60	19.93	38.20	21	18.75	38.39	- 0.19
20,001 - 35,000	53	17.61	55.81	28	25.00	63.39	- 7.58
35,001 - 62,000	65	21.59	77.40	23	20.54	83.93	- 6.53
62,001 - 657,700	68	22.59	99.99	18	16.07	100.00	
Total	301			112			
Median			\$30,051			\$26,967	

Net Income

Five percent of the continuing operators incurred net income losses in 1955, but none of those who discontinued farming incurred an income deficit (Table 5). Although the median net income from both farm and non-farm sources of the noncontinuing operators was slightly greater (\$2,901) than for the continuing operators (\$2,788), there was no significant difference in the distributions of those farm operators.

TABLE 5. Cumulative relative frequency of continuing and noncontinuing farm operators in 1965 by net income in 1955

Net Income in 1955	Continuing Farm Operators		Noncontinuing Farm Operators		Cumulative Percent Differences
	Number	Percent	Cumulative Percent	Number	Cumulative Percent
Net Loss					
2,501 - 3,500	1	0.33	0.33		0.33
1,501 - 2,500	4	1.33	1.66		1.66
501 - 1,500	4	1.33	2.99		2.99
less than 500	5	1.66	4.65		4.65
Net Income					
less than 500	9	2.99	7.64	8	7.14
501 - 1,500	47	15.61	23.25	16	14.28
1,501 - 2,500	65	21.59	44.84	24	21.43
2,501 - 3,500	54	17.94	62.78	20	17.86
3,501 - 4,500	32	10.63	73.41	14	12.50
4,501 - 5,500	27	8.97	82.38	11	9.82
5,501 - 6,500	17	5.65	88.03	6	5.36
6,501 - 7,500	10	3.32	91.35	5	4.46
7,501 - 8,500	4	1.33	92.68	6	5.36
8,501 - 9,500	6	1.99	94.67		
9,501 - 10,500	6	1.99	96.66		
10,501 - 15,500	6	1.99	98.65		
15,501 - 20,500	3	1.00	99.65		
20,501 +					
No information	1	0.33	99.98	2	1.79
					100.00
Total	301				
Median		\$2,788			\$2,901

Acres Owned, Rented and Farmed

It was supposed that the large operators continued to farm and grew larger while the small operators either became smaller or discontinued farming. Evidence available to support this, however, was confusing, as shown in Table 6.

Although the continuing operators did farm almost 100 acres more than those who discontinued farming (533 vs. 435 mean acres), those who owned less land (298 mean acres) continued farming while those owning more land (365 mean acres) discontinued farming. The continuing operators supplemented their ownership of land by renting more acres from others (351 mean acres) than did those who discontinued farming (144 mean acres).

Between 1955 and 1965 the farm operators tended to obtain and retain ownership of farm land whether or not they continued to farm. The major shift out of farming was through rental. The noncontinuing operators retained ownership of 93 percent of their land (338 or 365 acres) and rented it to others. Those who continued in farming expanded their operations (from 533 to 699 mean acres), first by owning more land, and second by renting more acres from others. The increase in ownership of land was more than twice the increase of renting (133 and 64 mean acre increase, respectively).

TABLE 6. Size of farm operations in 1955 and 1965 by operators continuing and not continuing to farm in 1965

No.	%	Mean Age in 1955	Mean Acres Owned		Mean Acres Rented From Others		Mean Acres Rented To Others		Mean Acres Farmed		
			1955	1965	1955	1965	1955	1965	1955	1965	
Total	413	100	48.2	316	406	295	304	37	129	507	511
Continuing	301	73	44.7	298	431	351	415	34	58	533	699
Not Con- tinuing	112	27	56.7	365	338	144	3	47	318	435	6

Age in 1955 - Younger and Older

The large age difference noted between the continuing and noncontinuing farm operators and the importance of age noted by Anderson (1967) suggested an analysis of the data by age. Farm operators who were under 55 years of age in 1955 were classified as younger; those operators 55 and over were classified as older. This classification was made for three reasons: First, the age class in which the proportion continuing in farming approximated 50 percent was 55 to 59 years. Second, the major difference between the cumulative relative frequency of the continuing and noncontinuing operators was at the 50 to 54 age class (Table 3). Third, the "older" operators would be 65 years of age or older by 1965, and, agewise, all would be eligible for social security retirement benefits.

Of the 413 operators from whom information was available for 1955 and 1965, 286, or 69 percent, were younger, and 127, or 31 percent, were older operators. The gap between the mean ages of the younger (41.6 years) and older (63.1 years) operators approximated that of a generation.

Net Worth

There was a significant difference in the distribution of farm operators classified by their net worth in 1955 for the younger and older operators (Table 7). A greater percentage of the younger farm operators in 1955 were in the

lower net worth classes than their older counterparts. The median net worth was \$38,571 for the older operators, and \$23,670 for the younger operators.

TABLE 7. Cumulative relative frequency of younger and older farm operators by net worth in 1955

Net Worth in 1955	Younger Farm Operators			Older Farm Operators			Cumulative Percent Differences
	Number	Percent	Cumulative Percent	Number	Percent	Cumulative Percent	
Deficit to + \$10,000	66	23.08	23.08	11	8.66	8.66	14.42
\$ 10,001 - \$ 20,000	65	22.73	45.81	16	12.60	21.26	24.55***
20,001 - 35,000	49	17.13	62.94	32	25.20	46.46	16.48
35,001 - 62,000	54	18.88	81.82	34	26.77	73.23	8.59
62,001 - 657,700	52	18.18	100.00	34	26.77	100.00	
Total	286			127			
Median			\$23,670			\$38,571	

***Significant at the 0.1% level.

Net Income

There was a significant difference in the distribution of farm operators classified by their net income in 1955 for the younger and older operators (Table 8). A greater percentage of the older operators were in the lower net income classes in 1955 than the younger farm operators. The median net income from both farm and non-farm sources was \$3,040 for the younger operators, and \$2,384 for the older operators.

TABLE 8. Cumulative relative frequency of younger and older farm operators by net income in 1955

Net Income in 1955	Younger Farm Operators			Older Farm Operators			Cumulative Percent Differences
	Number	Percent	Cumulative Percent	Number	Percent	Cumulative Percent	
Net Loss							
2,501 - 3,500	1	0.35	0.35				0.35
1,501 - 2,500	4	1.40	1.75				1.75
501 - 1,500	2	0.70	2.45				0.88
less than 500	5	1.75	4.20	2	1.57	1.57	2.65
Net Income							
less than 500	8	2.80	7.00	9	7.09	8.66	1.66
501 - 1,500	37	12.94	19.94	26	20.47	29.13	9.19
1,501 - 2,500	59	20.63	40.57	30	23.62	52.75	12.18
2,501 - 3,500	50	17.48	58.05	24	18.90	71.65	13.60 [†]
3,501 - 4,500	40	13.99	72.04	6	4.72	76.37	4.33
4,501 - 5,500	28	9.79	81.83	10	7.87	84.24	2.41
5,501 - 6,500	18	6.29	88.12	5	3.94	88.18	0.06
6,501 - 7,500	10	3.50	91.62	5	3.94	92.12	0.50
7,501 - 8,500	6	2.10	93.72	4	3.15	95.27	1.55
8,501 - 9,500	5	1.75	95.47	1	0.79	96.06	0.59
9,501 - 10,500	5	1.75	97.22	1	0.79	96.85	0.37
10,501 - 15,500	6	2.10	99.32	2	1.57	98.42	0.90
15,501 - 20,500	1	0.35	99.67	2	1.57	99.99	0.32
20,501 +	1	0.35	100.02				
No Information							
Total	286			127			
Median			\$3,040			\$2,384	

[†]Significant at the 10% level.

Acres Owned, Rented and Farmed

It was supposed that the older operators would be larger farm operators, since they would have had more years in which to acquire land through purchase or rental. Evidence shown in Table 9 does not support this. Although the older operators did own almost twice as many acres as the younger operators (477 vs. 244 mean acres), those who were younger farmed only eleven acres less than those operators who were older (503 vs. 514 mean acres). The younger farm operators compensated for their comparative lack of ownership by renting more land from others (362 vs. 142 mean acres) and renting fewer acres to others (22 vs. 70 mean acres).

Although both age groups increased their ownership of land between 1955 and 1965, the increase by the younger operators was almost six times that of the older operators (120 vs. 23 mean acre increase). The younger operators increased the number of acres rented from others and acres farmed (59 and 141 mean acre increase, respectively). However, those who were older markedly decreased their farming and rentals from others (302 and 104 mean acre decrease, respectively), and greatly increased the amount of land rented to others (238 mean acre increase).

TABLE 9. Size of farm operations in 1955 and 1965 by age of operators as younger or older in 1955

	No.	%	Mean Age in 1955	Mean		Mean		Mean			
				Acres Owned 1955	1965	Acres Rented From Others 1955	1965	Acres Rented To Others 1955	1965	Acres Farmed 1955	1965
Total	413	100	48.2	316	406	295	304	37	129	507	511
Younger	286	69	41.6	244	364	362	421	22	49	503	644
Older	127	31	63.1	477	500	142	38	70	308	514	212

Age and Continuity

The significantly large age difference noted between the continuing and noncontinuing operators suggested an interaction of age and continuity in farming. A four-fold classification was established, and the 413 operators from whom information was obtained in 1955 and 1965 were distributed as follows:

1. younger and continuing farm operators ----- 60%
2. younger and noncontinuing farm operators -- 10%
3. older and continuing farm operators ----- 13%
4. older and noncontinuing farm operators ---- 17%

This permitted noting the differences between age within the continuity classification, and between those continuing to farm and those not continuing to farm within the age classification.

Net Worth

A significantly greater percentage of the older continuing and noncontinuing farm operators were in the higher net worth classes than the younger continuing and noncontinuing operators in 1955 (Tables 10 and 11).

Among the younger operators there was a significant difference between the continuing and noncontinuing; the median net worth was \$26,625 for the continuing operators, and \$14,616 for the noncontinuing operators.

The median net worth for the older continuing operators

was higher (\$46,704) than for the older noncontinuing operators (\$33,636). However, this difference was not significant (Table 11).

TABLE 10. Distribution of net worth classes in 1955 by age and continuation in farming

Net Worth in 1955	Younger				Older				All	
	Continuing		Noncontinuing		Continuing		Noncontinuing		Continuing	
	No.	%	No.	%	No.	%	No.	%	No.	%
Deficit to + \$10,000	52	21.14	14	35.00	3	5.45	8	11.11	77	18.64
\$ 10,001 - \$ 20,000	52	21.14	13	32.50	8	14.55	8	11.11	81	19.61
20,001 - 35,000	43	17.48	6	15.00	10	18.18	22	30.56	81	19.61
35,001 - 62,000	50	20.32	4	10.00	15	27.27	19	26.39	88	21.31
62,001 - 657,700	49	19.92	3	7.50	19	34.55	15	20.83	86	20.82
Total	246	100.00	40	100.00	55	100.00	72	100.00	413	99.99
Median	\$26,625		\$14,616		\$46,704		\$33,636		\$28,988	

TABLE 11. Median net worth in 1955 and levels of significance by age and continuation in farming

Sub Classes	No.	Median Net Worth	Levels of Significance			
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing	
Younger-Continuing	246	\$26,625	2.5%	2.5%	5%	
Younger-Noncontinuing	40	\$14,616	0.1%	0.1%		
Older-Continuing	55	\$46,704	NS			
Older-Noncontinuing	72	\$33,636				

NS - Not Significant

Net Income

The median net income for the older operators was less than for the younger operators (Tables 12 and 13). And, within age groups, the median net income was less for those who continued to farm than those who did not continue to farm. However, the major significant difference was between the younger and the older continuing operators.

TABLE 12. Distribution of net income classes in 1955 by age and continuation in farming

Net Income in 1955	Younger				Older				All	
	Continuing		Noncontinuing		Continuing		Noncontinuing		No.	%
	No.	%	No.	%	No.	%	No.	%		
Net Loss										
2,501 -	1	0.41							1	0.24
1,501 -	4	1.63							4	0.97
501 -	2	0.81							4	0.97
less than 500	5	2.03			2	3.64			5	1.21
Net Income										
less than 500	6	2.44	2	5.00	3	5.45	6	8.33	17	4.12
501 -	32	13.01	5	12.50	15	27.27	11	15.27	63	15.25
1,501 -	51	20.73	8	20.00	14	25.45	16	22.22	89	21.55
2,501 -	43	17.48	7	17.50	11	20.00	13	18.06	74	17.92
3,501 -	29	11.79	11	27.50	3	5.45	3	4.17	46	11.14
4,501 -	25	10.16	3	7.50	2	3.64	5	11.11	38	9.20
5,501 -	17	6.91	1	2.50			5	6.94	23	5.57
6,501 -	9	3.66	1	2.50	1	1.82	4	5.56	15	3.63
7,501 -	4	1.63	2	5.00			4	5.56	10	2.42
8,501 -	5	2.03			1	1.82			6	1.45
9,501 -	5	2.03			1	1.82			6	1.45
10,501 -	6	2.44					2	2.78	8	1.94
15,501 -	1	0.41			2	3.64			3	0.73
20,501 +										
No Information	1	0.41							1	0.24
Total	246	100.00	40	100.00	55	100.00	72	100.00	413	100.00
Median	\$3,012		\$3,215		\$2,036		\$2,732		\$2,818	

TABLE 13. Median net income in 1955 and levels of significance by age and continuation in farming

Sub Classes	No.	Median Net Income	Levels of Significance		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	\$3,012	NS	2.5%	NS
Younger-Noncontinuing	40	\$3,215	NS	10.0%	
Older-Continuing	55	\$2,036	NS		
Older-Noncontinuing	72	\$2,732			

NS - Not Significant

1955 Acres Owned, Rented and Farmed

The younger operators who continued to farm owned significantly fewer acres (260 mean acres) than the older noncontinuing operators (487 mean acres) and were within three acres of being significantly different from the older continuing operators (464 mean acres) (Tables 14 and 15). The mean acres owned by the younger noncontinuing operators (145 mean acres) was significantly less than the number of acres owned by the older operators. There was no significant difference for continuing and noncontinuing operators in both age classes.

The younger continuing farm operators rented significantly more acres from others (399 mean acres) than the younger noncontinuing (135 mean acres), older continuing (134 mean acres) and older noncontinuing operators (148 mean acres) (Tables 14 and 16). There was no significant difference between the cross classifications of the latter three farm operator classes.

Significantly fewer acres were rented to others by the younger continuing and noncontinuing farm operators (23 and 17 mean acres, respectively) than the older continuing and noncontinuing operators (79 and 64 mean acres, respectively) (Tables 14 and 17). There was no significant difference in each age class between the continuing and noncontinuing farm operators.

The differences between the means of the acres farmed

were not significant among the cross classifications of the four farm operator classes (Table 18). However, it is noted that the younger noncontinuing operators were within six acres of being significantly different from the younger continuing operators. The younger noncontinuing operators farmed considerably fewer acres (246 mean acres) than the younger continuing, older continuing and older noncontinuing operators, who farmed nearly equal numbers of acres (545, 480 and 540 mean acres, respectively) (Table 14).

TABLE 14. Size of farm operations in 1955 and 1965

Farm Operators	No.	%	Mean Age in 1955	Mean Acres Owned		Mean Acres Rented From Others		Mean Acres Rented To Others		Mean Acres Farmed	
				1955	1965	1955	1965	1955	1965	1955	1965
Total	<u>413</u>	<u>100</u>	48.2	316	406	295	304	37	129	507	511
Continuing	301	73	44.7	298	431	351	415	34	58	533	699
Not Continuing	112	27	56.7	365	338	144	3	47	318	435	6
Younger	<u>286</u>	<u>70</u>	41.6	244	364	362	421	22	49	503	644
Continuing	246	60	41.3	260	407	399	489	23	44	545	748
Not Continuing	40	10	43.5	145	102	135	3	16	77	246	4
Older	<u>127</u>	<u>30</u>	63.1	477	500	142	38	70	308	514	212
Continuing	55	13	61.8	464	541	134	84	79	121	480	481
Not Continuing	72	17	64.1	487	469	148	3	64	452	540	7

TABLE 15. Differences between sub class means of acres owned in 1955

Sub Classes	No.	Mean Acres Owned	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	260	227* (185)	203 (206)	115 (235)
LSD					
Younger-Noncontinuing	40	145	342* (272)	319* (287)	
LSD					
Older-Continuing	55	464	24 (247)		
LSD					
Older-Noncontinuing	72	487			

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

TABLE 16. Differences between sub class means of acres rented from others in 1955

Sub Classes	No.	Mean Acres Rented From Others	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	399	251* (123)	266* (136)	265* (156)
LSD					
Younger-Noncontinuing	40	135	14 (180)	1 (190)	
LSD					
Older-Continuing	55	134	15 (164)		
LSD					
Older-Noncontinuing	72	148			

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

TABLE 17. Differences between sub class means of acres rented to others in 1955

Sub Classes	No.	Mean Acres Rented To Others	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	23	40*	55*	7
LSD			(32)	(36)	(41)
Younger-Noncontinuing	40	16	48*	63*	
LSD			(47)	(50)	
Older-Continuing	55	79	15		
LSD			(43)		
Older-Noncontinuing	72	64			

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

TABLE 18. Differences between sub class means of acres farmed in 1955

Sub Classes	No.	Mean Acres Farmed	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	545	5 (240)	5 (267)	299 (305)
LSD					
Younger-Noncontinuing	40	246	294 (353)	234 (372)	
LSD					
Older-Continuing	55	480	60 (320)		
LSD					
Older-Noncontinuing	72	540			

The least significant difference values are enclosed in parentheses.

Changes Between 1955 and 1965 in Acres Owned, Rented and Farmed

The continuing farm operators increased their land ownership between 1955 and 1965, while those operators who discontinued farming after 1955 decreased their acreage ownership (Table 14). The difference of increase or decrease in mean acres owned was significant between the younger continuing operators and, both younger and older, noncontinuing operators (Table 19).

The younger continuing operators' mean increase of acres owned was twice as much as the older operators'. The mean decrease for the younger noncontinuing operators was twice as great as the reduction of acreage ownership by the older operators. The total mean increase of acres owned by the continuing operators was considerably greater than the total mean decrease by the noncontinuing operators.

The younger continuing operators increased the number of acres they rented from others, but the younger noncontinuing, older continuing and older noncontinuing operators decreased their rentals from others between 1955 and 1965 (Tables 14 and 20). The mean decreases of rentals for the noncontinuing operators were three to four times as great as the reduction of renting by the older continuing operators. However, the difference of increase or decrease of mean acres rented from others was not significant.

All farm operators increased their acreage rentals to others between 1955 and 1965 (Table 14). The difference of

increase in mean acres rented to others by the older noncontinuing operators was significantly greater when compared with the younger continuing, younger noncontinuing and older continuing operators (Table 21).

Although the younger continuing operators increased the number of acres farmed between 1955 and 1965, the older continuing farmers did not increase or decrease the amount of land they farmed (Table 14). Naturally, the noncontinuing operators decreased the number of acres farmed between 1955 and 1965.

The difference of increase or decrease in mean acres farmed was significant between the younger continuing operators and the younger noncontinuing and older noncontinuing operators (Table 22). The difference of decrease in mean acres farmed was significant between the older noncontinuing and continuing operators.

TABLE 19. Differences between sub class means of changes in acres owned, 1955 to 1965

Sub Classes	No.	Difference Between Mean Acres Owned 1955 to 1965	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	146	165*	69	189*
LSD			(86)	(95)	(109)
Younger-Noncontinuing	40	-43	24	120	
LSD			(126)	(133)	
Older-Continuing	55	77	96		
LSD			(115)		
Older-Noncontinuing	72	-19			

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

TABLE 20. Differences between sub class means of changes in acres rented from others, 1955 to 1965

Sub Classes	No.	Difference Between Mean Acres Rented From Others 1955 to 1965	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	90	236	140	222
LSD			(258)	(287)	(328)
Younger-Noncontinuing	40	-132	14	83	
LSD			(379)	(400)	
Older-Continuing	55	-49	96		
LSD			(345)		
Older-Noncontinuing	72	-146			

The least significant difference values are enclosed in parentheses.

TABLE 21. Differences between sub class means of changes in acres rented to others, 1955 to 1965

Sub Classes	No.	Difference Between Mean Acres Rented To Others 1955 to 1965	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	20	368*	22	41
LSD			(176)	(196)	(224)
Younger-Noncontinuing	40	61	327*	19	
LSD			(260)	(274)	
Older-Continuing	55	42	346*		
LSD			(236)		
Older-Noncontinuing	72	388			

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

TABLE 22. Differences between sub class means of changes in acres farmed, 1955 to 1965

Sub Classes	No.	Difference Between Mean Acres Farmed 1955 to 1965	Sub Class Differences			
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing	Younger- Continuing
Younger-Continuing	246	195	729*	195	438*	
LSD			(336)	(374)	(427)	
Younger-Noncontinuing	40	-242	291	243		
LSD			(494)	(520)		
Older-Continuing	55	0	534*			
LSD			(448)			
Older-Noncontinuing	72	-533				

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

1965 Acres Owned, Rented and Farmed

The younger operators who quit farming owned significantly fewer acres in 1965 than the younger continuing, older continuing and older noncontinuing operators (Tables 14 and 23). The younger continuing operators had increased their acreage ownership in 1965 to the extent that they were no longer significantly smaller land owners than the older operators, as they had been in 1955.

While the younger continuing operators rented approximately six times as many acres from others in 1965 as the older continuing operators, the noncontinuing operators almost completely ceased renting land from others (Tables 14 and 24). Consequently, the younger continuing operators rented significantly more acres from others than the younger noncontinuing, older continuing and older noncontinuing operators.

The older noncontinuing farm operators rented significantly more acres to others in 1965 than the younger continuing, younger noncontinuing and older continuing operators (Tables 14 and 25). However, there was no significant difference between the cross classifications of the latter three farm operator classes.

The younger continuing operators farmed significantly more acres than both the younger and older noncontinuing operators (Tables 14 and 26). The older continuing operators farmed significantly more acres than the older noncontinuing

operators and were within ten acres of farming significantly more than the younger noncontinuing operators. However, there was no significance between the two continuing classes even though the older operators farmed only two-thirds the number of acres as the younger operators.

TABLE 23. Differences between sub class means of acres owned in 1965

Sub Classes	No.	Mean Acres Owned	Sub Class Differences			
			Older-Noncontinuing	Older-Continuing	Younger-Noncontinuing	
Younger-Continuing	246	407	62 (227)	134 (253)	305* (289)	
LSD						
Younger-Noncontinuing	40	102	367* (334)	439* (352)		
LSD						
Older-Continuing	55	541	72 (304)			
LSD						
Older-Noncontinuing	72	469				

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

TABLE 24. Differences between sub class means of acres rented from others in 1965

Sub Classes	No.	Mean Acres Rented From Others	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	489	486*	405	487*
LSD			(269)	(300)	(343)
Younger-Noncontinuing	40	3	0	82	
LSD			(396)	(418)	
Older-Continuing	55	84	81		
LSD			(360)		
Older-Noncontinuing	72	3			

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

TABLE 25. Differences between sub class means of acres rented to others in 1965

Sub Classes	No.	Mean Acres Rented To Others	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	44	408*	76	33
LSD			(180)	(201)	(229)
Younger-Noncontinuing	40	77	375*	43	
LSD			(265)	(279)	
Older-Continuing	55	121	331*		
LSD			(241)		
Older-Noncontinuing	72	452			

Significant at the 5% level.

The least significant difference values are enclosed in parentheses.

TABLE 26. Differences between sub class means of acres farmed in 1965

Sub Classes	No.	Mean Acres Farmed	Sub Class Differences		
			Older- Noncontinuing	Older- Continuing	Younger- Noncontinuing
Younger-Continuing	246	748	741*	267	744*
LSD			(314)	(350)	(400)
Younger-Noncontinuing	40	4	3	477	
LSD			(462)	(487)	
Older-Continuing	55	481	474*		
LSD			(420)		
Older-Noncontinuing	72	7			

*Significant at the 5% level.
The least significant difference values are enclosed in parentheses.

The findings with respect to acres owned, rented and farmed for both 1955 and 1965 may be summarized as follows: Among the younger operators in 1955, those continuing owned almost twice as much land (260 vs. 145 mean acres), rented nearly three times as many acres (399 vs. 135 mean acres) and farmed over twice the number of acres (545 vs. 246 mean acres) as those who discontinued farming. Between 1955 and 1965 these younger continuing operators increased the number of acres owned, rented from others, rented to others and farmed. Those not continuing to farm decreased their ownership of land, increased rentals to others and decreased rentals from others.

Among the older operators in 1955, the situation was somewhat reversed. Those continuing not only farmed less land than those not continuing (540 vs. 480 mean acres); they also owned (464 vs. 487 mean acres) and rented from others (134 vs. 148 mean acres) slightly less land. Even though these older operators who continued to farm increased their ownership of land almost 80 acres between 1955 and 1965, their increase of acres farmed was negligible (1 acre). The adjustment was made by renting fewer acres from others and more acres to others. Those who discontinued farming retained ownership of almost all their land, but markedly decreased their rentals from others and increased their rentals to others.

It was supposed that the noncontinuing operators would

"sell out" when they "got out" of farming. This was not true among the older operators, for they retained ownership of 96 percent of the land they had owned in 1955 (469 of 487 mean acres). Even the younger operators who had discontinued farming retained ownership of 70 percent of their land owned in 1955 (102 of 145 mean acres). The major shift out of farming was through rental - almost a complete cessation of renting from others and a marked increase of rentals to others.

Among the continuing operators, both age groups increased ownership, but the increase by the younger operators was almost double that of the older operators. While the younger operators increased their rentals from others, those who were older decreased their acres rented from others (+90 vs. -50 acres), but their increase in rentals to others was double that of the younger operators (42 vs. 21 acres). Although both age groups increased their ownership of farm land between 1955 and 1965, the older operators did not increase their farming operations, but the younger operators farmed over 200 more acres.

SUMMARY

The basic data for this study were collected from a stratified random sample of Kansas farm operators in 1955. The sample was evaluated and found to provide a reliable estimate of the Kansas farm operator population (Morse, 1965, pp. 88-91). A follow-up survey of those operators was conducted in 1965. An analysis of those data revealed no significant difference between respondents and nonrespondents with respect to size of farm in 1955; but a significant difference with respect to age (Anderson, 1967). Thus, those who replied in 1965 were considered representative of 1955 farming operations.

A measure of validity of those two population estimates was obtained by contrasting them with 1954 and 1964 U. S. Census of Agriculture figures for Kansas. The total number of operators in the survey declined 27 percent between 1955 and 1965, whereas, the decrease between the Census years was 23 percent. Even though the survey estimates of average farm size were larger in both years, the percentage increase of farm size was nearly equal: 38 percent in the survey and 31 percent in the Census. The total acres being farmed by the survey operators increased 0.9 percent between 1955 and 1965, whereas comparable data from the Census disclosed an increase of 0.5 percent. Thus, it was concluded that those two estimates roughly reflect both the total acres farmed in Kansas and the change in total acres farmed between 1955 and 1965.

There were, however, shifts in ownership and rental of land over this ten year period. They are reflected in the reports of 413 operators from whom there was information in both 1955 and 1965. Those operators did not interact solely with each other, but with other operators not in the sample. As shown in Table 14, more land was bought than sold. Also, a greater number of acres was rented to others than rented from others. In spite of those apparent contradictions, the acres involved can be accounted for: If the difference in mean acres owned (90) and rented from others (9) is reduced by the change in mean acres rented to others (92), the resultant of 7 mean acres approximately equals the change in mean acres farmed (4) between 1955 and 1965. The three acre difference is the result of rounding errors. The acres are thus accounted for. The next question concerns the characteristics of the 413 operators who were farming in 1955 and were either farming in 1965 or had discontinued farming.

The older operators who discontinued farming retained title to their land, making major adjustments by increasing acres rented to others and reducing acres rented from others. Furthermore, even though those older operators remaining in farming did not increase operations, they did increase ownership. The younger continuing operators expanded operations with land acquired through purchase or rental. And, even those younger operators who discontinued farming retained title to much of the land. This would seem to indicate a

high propensity to obtain and retain ownership of farm land; a practice that might have serious implications for agriculture and farm management.

With respect to net worth and total net income, there was no significant difference between the continuing and non-continuing operators, but there was a significant difference between age groups. A significantly greater percentage of the older operators were in the higher net worth classes, reflecting their larger land ownership. However, a significantly greater percentage of the younger operators were in the higher total net income classes than the older operators.

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KANSAS FARM OPERATORS - 1955 AND 1965
A LONGITUDINAL STUDY

by

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The basic data for this study were collected in 1955 from a stratified random sample of Kansas farm operators (Morse, 1965). In 1965 a follow-up mail survey provided a set of longitudinal data from 413 of those 527 Kansas farm operators. The data were considered reliable and useful for identifying shifts between 1955 and 1965 in continuation in farming, farm mobility and changes in farm size (Anderson, 1967).

The objectives of this study were to: (1) determine differences in 1955 farm characteristics of net worth, total net income and acres owned, rented from others, rented to others and farmed between operators classified by: continuation in farming, age and their combinations; and (2) study changes in number of acres owned, rented from others, rented to others and farmed between 1955 and 1965 for the above farm operator classifications.

The farm operators tended to obtain and retain ownership of farm land whether or not they continued to farm; the major shift out of farming was through rental. The older operators who discontinued farming retained ownership of most of their land, but rented it to others and ceased renting land from others. Even those younger operators who discontinued farming retained title to much of their land and rented it to others. Contrariwise, those who continued in farming acquired ownership of more land, but only the younger operators increased the number of acres operated. The older operators

offset their increase in acres owned by renting more acres to others and decreasing rentals from others. The younger continuing operators expanded their operations by acquiring land through both purchase and rental.

A significantly greater percentage of the older operators had higher net worth than the younger operators, whereas the younger operators had significantly higher total net income. There was no significant difference in net worth or net income between the farm operators in 1955 who continued or had discontinued farming by 1965.